September 19, 2013

Ms. Marlene H. Dortch
Secretary
Federal Communication Commission
445 12th Street SW
Washington, DC 20554

Re: Notice of *Ex Parte* Communication, WC Docket No. 13-184

Dear Ms. Dortch:

On September 11, 2013, Susan Hargrave, State E-Rate Coordinator, Massachusetts Department of Elementary and Secondary Education, Wendy Haskell, Director of Technology and Libraries, Falmouth Public Schools, Robert Walton, Information Technology Officer, Worcester Public Schools, and Dennis Villano, Robert Cunha, and John Allegretto of the Burlington Public Schools (collectively, IT Officers) spoke via telephone with Lisa Hone, James Bachtell, Michael Steffen, Soumitra Das, Charles Eberle, Mark Nadel, and Mark Walker of the Wireline Competition Bureau. The purpose of the call was to discuss several aspects of the Massachusetts school information technology capabilities, spending, strategy, and infrastructure and also to seek the districts' input on the Commission's July 23, 2013 Notice of Proposed Rulemaking in the above-referenced docket. The IT Officers provided the following information during the call:

- *Internet access and WANs*. Burlington purchases a 400 Mbps Internet, consisting of a 250 Mbps connection and a 150 Mbps connection, for its six schools (4,000 students) at a rate of approximately $12,000/month before any E-rate support. Mr. Villano anticipates that this connection, in combination with load balancing capabilities, will sufficient to support the district's planned 1-to-1 tablet program. Burlington has a 10 Gbps wide area network (WAN) connecting all schools and several town buildings. The WAN is owned jointly with Comcast, and Burlington does not have any recurring lease or maintenance costs for the WAN.

  Falmouth's does not currently have a WAN, but six of the district's eight buildings have line-of-sight wireless microwave connections used for administrative services. The two remaining buildings rely on a virtual private network to exchange administrative information. The district is seeking a grant to connect to a fiber backbone that passes all seven schools. The district purchases 30 Mbps Internet access connections for its middle school and junior high and two connections (50 Mbps and 30 Mbps) for the high school. These cable modem connections cost $89-$115/month, totaling $8,000/yr. Falmouth's four elementary schools have 16 Mbps Internet connections provided for free by Comcast. Falmouth has a total of 3,800 students district wide.

Worcester is a larger, urban district with 25,000 students and 50 schools. The district pays $16,000/month for a bundle of services that includes two 150 Mbps Internet access connections, two leased firewalls, two 1 Gbps circuits at the Internet access points. The district spends an additional $67,000/month on a WAN that connects all nine middle and high schools at 100 Mbps and the other 41 schools at 10 Mbps. The WAN includes two data centers and a 10 Gbps connection to the network operation center. Mr. Walton's staff evaluates the districts bandwidth usage annually before applying for E-rate support, in part to have detailed data available for potential audit questions.

- *Multiple Internet Connections*. All three districts emphasized that reliable Internet connections are essential. Worcester and Burlington both purchase two Internet access connections so that they have reliable service if one goes down. The IT Officers emphasized that increased use on the Internet in the classroom and student information systems (SIS) mean that districts can't "put all their eggs in one basket" when it comes to Internet access connections. They understand why E-rate doesn't pay for dormant connections, but suggested that E-rate should support flexible connection designs that provide for backup in the event of an outage.

- *BYOD*. Falmouth permits bring your own device (BYOD) in its high school and also provides iPad carts. The district is conducting a BYOD pilot program in its lower schools. Worcester does not currently have BYOD, though the district currently provides approximately many tablets and work stations.

- *WiFi*. Falmouth has full WiFi coverage in all schools, with one wireless access point (WAP) per classroom in the high school, one WAP for every two classrooms in the junior high, and fewer WAPs distributed throughout the lower schools. This infrastructure, in combination with load balancing and sonic wall software that prioritizes certain traffic, is sufficient for the district's current WiFi needs. All WAPs are 802.11n and the district installed all themselves, using their electrician to assist with wiring. Ms. Haskell noted that districts typically purchase the same WiFi equipment for all schools because district staff has to support and manage the entire network and it is more difficult to manage several different types of equipment.

  Burlington's entire WiFi infrastructure is provided by Cisco under a five year lease/purchase plan. Mr. Villano explained that a comprehensive package that includes maintenance and management is best for the district even if it could have spent less on equipment. Burlington has a total of 300 WAPs, one WAP per classroom in the high school, middle school, and a new elementary school, and 90% coverage in the other schools. All WAPs are 802.11n, 2.4/5 Ghz, with three radios and cost $480 each before

cabling or installation. Burlington also purchased five wireless controllers, each capable of handling 300 WAPs, for $16,000 each. The district's WiFi is sufficient to support its 1-to-1 program.

Worcester's WiFi deployment has been dependent on the availability of E-rate support. The district currently has building-wide WiFi in 34 schools and three or four WAPs in the remaining 16 schools. Mr. Walton described the WAP deployment as "first generation," with a typical deployment of three WAPs in a hallway serving six classrooms. Though all WAPs are 802.11n and 2.4/5Ghz, the current network could not support 1-to-1 device traffic. Mr. Walton agreed that there are efficiencies in having the same WiFi equipment across the districts. The district chose WAPs from Hewlett Packard that offer no maintenance costs and a lifetime warranty and cost $550/each The district is evaluating Cisco Meraki WAPs which cost $695 upfront and have an annual recurring cost of $70-$140/year per WAP. Meraki WAPs still require data cabling but do not require expensive controllers to manage and maintain. Instead the controllers are in the cloud and hosted by Meraki, a service that is covered in the required annual costs. Traffic does not flow through the cloud controllers, but rather allows for one centralized location to easily manage all WAPs. Since annual costs maintenance costs are required, the district may be put in a situation in which it receives Priority 2 funds to install the Meraki WAPs but later may not receive the Priority 2 Basic Maintenance to cover the annual support costs.

- *Cloud services.* The IT Officers agreed that the cloud now serves core educational functions. Ms. Haskell noted that BYOD requires extensive use of the cloud, because the applications used across all devices are all web-based. Falmouth and Burlington both utilize Google's free Gmail service. Falmouth also pays $7,500 for Gmail archiving, which is not E-rate eligible. Burlington emphasized that they have an "open" approach to the cloud and generally allow access to sites that other districts may block while still meeting CIPPA requirements.

- *Standardized testing.* Massachusetts schools will participate in the Partnership for Assessment of Readiness for College and Careers (PARCC) standardized test beginning in the 2014-2015 school year. The tests may be staggered within small windows of time to lessen stress on networks, but in general they will be conducted at the same time across the state. The IT Officers agreed that PARCC will substantially increase their bandwidth needs. Mr. Cunha has contacted providers to inquire about arrangements that would allow Burlington to have access to additional bandwidth at times of highest need (e.g. during PARCC testing).

- *Caching*. Caching equipment/services, which are not currently eligible for E-rate support, are one way to help reduce the stress on a district's network during times of high traffic. The IT Officers agreed that schools will need large caching capabilities that most do not currently have for the PARCC. Mr. Walton explained that Worcester purchased additional bandwidth, rather than upgrading its caching equipment, because the cost of additional bandwidth is covered by E-Rate and caching equipment is not. He cited this as an example of how districts' purchasing decisions are shaped by E-rate. He explained that E-rate disfavors high up-front investment costs in equipment that would save money on recurring costs over the long term, such as caching equipment and VoIP phones.

- *Planning and purchasing*. Massachusetts requires all school districts to have a five year technology plan, but the IT Officers agreed that these plans are often just a formality because five years is too long a window. The districts typically reach out to providers well in advance of the expiration of existing agreements. Burlington has potential WiFi upgrades built into the district's annual budget so that it does not have to request money for individual projects.

  Mr. Walton pointed out that the three districts purchase widely varying Internet speeds at different costs. He said that districts have no incentive to purchase efficient service or prove that they need the services they buy because E-rate audits do not ask applicants to justify their Internet and WAN speeds. He believes that this often leads to many districts paying for high-capacity connections that they do not need. He suggested that a per-student cap or similar limit could address this issue.

- *Misc*
  - Mr. Villano pointed out that E-rate support for fiber between buildings on school campuses could lower recurring WAN costs.
  - Ms. Haskell is concerned about phasing out E-rate support for phone service, which is still a large expense in many districts.

Respectfully submitted,
_____/s/_____
Charles Eberle
Attorney-Adviser, Telecommunications Access Policy Division, Wireline Competition Bureau